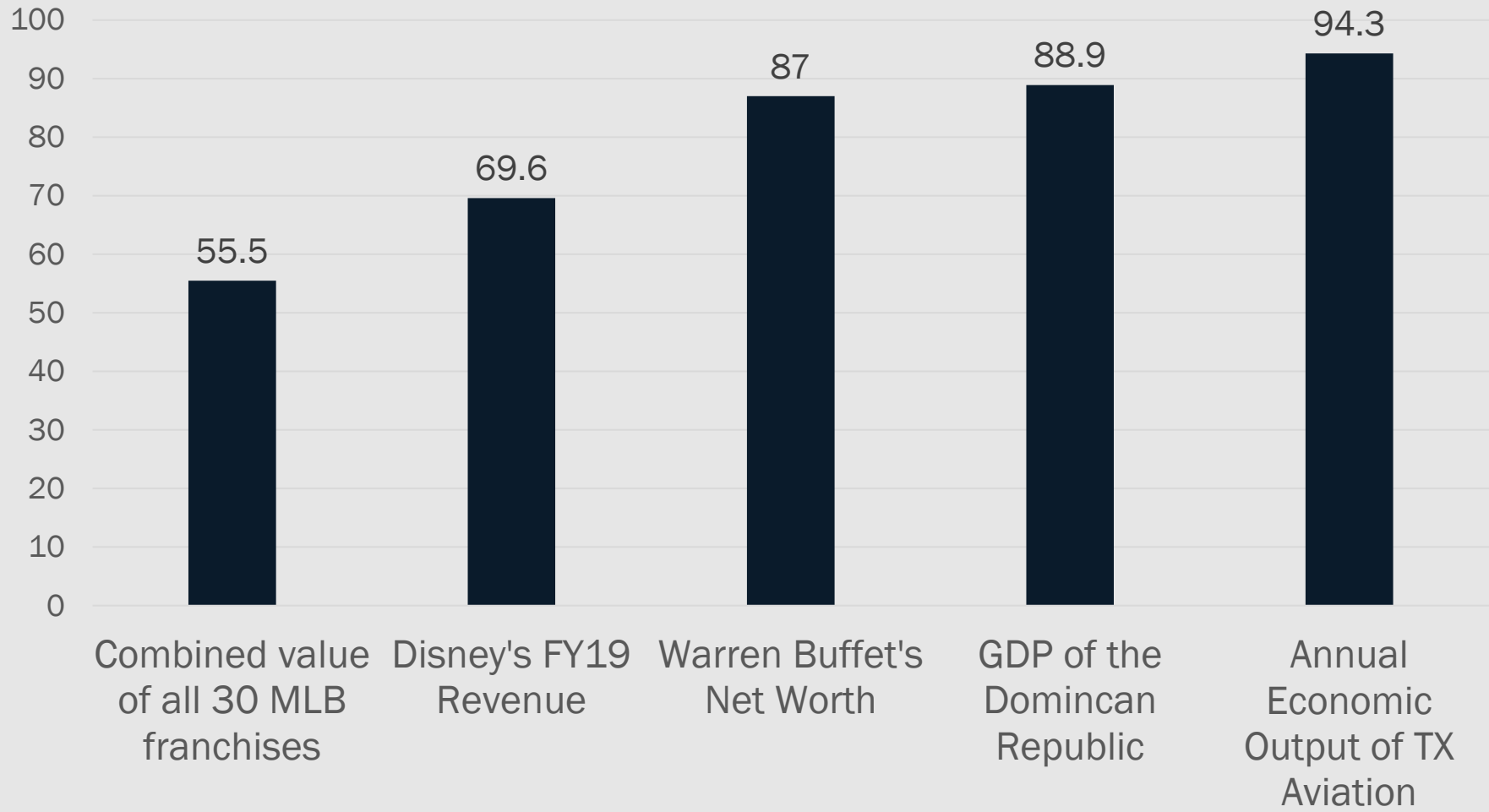


Aviation in Texas – A Comparison


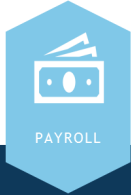

What's it worth? (billions of \$)



Texas' Airport System Rankings

- #1
 - National, Regional, and Local GA Assets
- #2
 - Total NPIAS airports
 - Reliever airports
 - Based aircraft (9.4% of national total)
 - ATP pilots, remote pilots, and flight instructors
- #3
 - Total, student, commercial, private, glider, and sport pilots
 - Total aircraft operations, all types (7.8% of national total)
 - Total GA aircraft operations (7.5% of national total)

AIRPORT SYSTEM ECONOMIC IMPACTS

	 EMPLOYMENT	 PAYROLL	 OUTPUT
Impact Type			
Direct	490,404	\$17.5 billion	\$49.2 billion
Multiplier	288,551	\$12.6 billion	\$45.1 billion
Total	778,955	\$30.1 billion	\$94.3 billion



Unmanned Aerial Systems

Preliminary Factors to consider in the Selection of Operating Locations in North Texas

December 3, 2020

Chris Yakabe & Mike Whitted, InnoVets LLC

INNOCVETS

Today's Presentation:

20 minutes

- Basic considerations for site selection
- Case Studies
- Discussion





Choosing a Location (site selection & suitability)

- Define Mission (defining the mission will drive location selection or else “work backwards”)
- Large or small UAS?
- Vertical or fixed-wing? (Both?)
- Focus on a specific area(s) of concentration (Research, commerce, package delivery, wildlife or LE surveillance, disaster response, oil field/rig inspection, pipeline/powerline/rail inspection, etc.)
- “Ecosystem” (Grand Sky: General Atomics and Northrop-Grumman)



Logistic Support

- Existing or customizable work-space (offices, hangars, maintenance)
- Security (physical, virtual/intellectual)
- Fuel availability (petroleum based, electrical/battery charging)
- Utilities, IT infrastructure/accessibility
- Data transfer and storage (cyber)
- Transportation (accessibility/towing)



Environmental Considerations

- General Weather trends (temperature, cloud cover, density altitude)
- Historical winds (particularly crosswinds; runway not always aligned toward prevailing wind. Some UAS particularly sensitive)
- Wildlife habitat (indigenous & migratory)
- Hazardous material handling & disposal (e-waste, composites)
- Environmental assessment/impact statement mandate

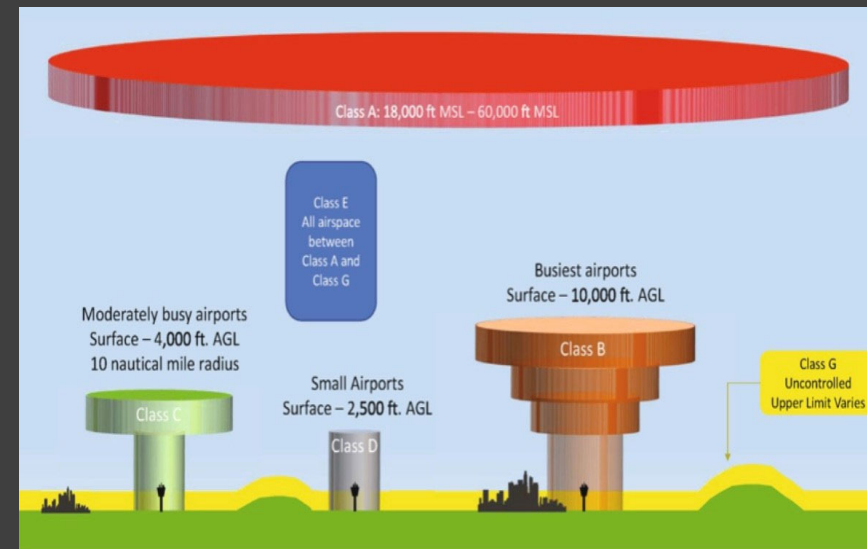
Airspace Considerations

Customer needs vs. Accessibility

Integrating manned & unmanned aircraft

Flight restrictions

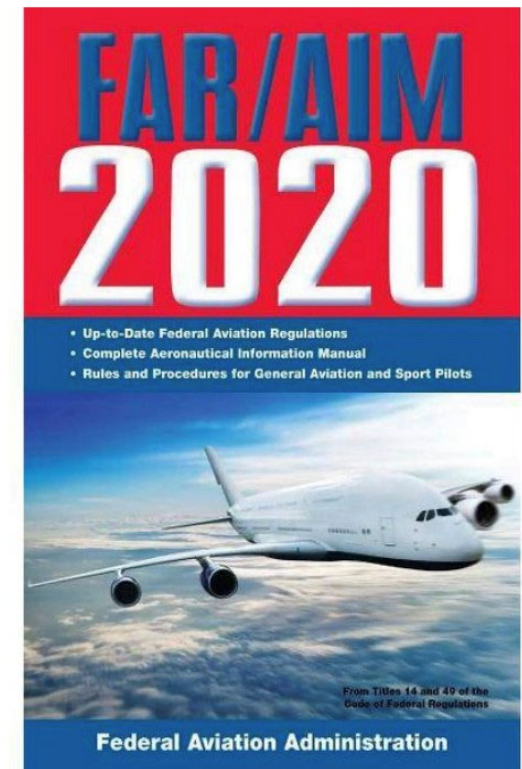
Wildlife or environmentally sensitive areas



INNOVETS

Regulations & how they apply to your unique situation

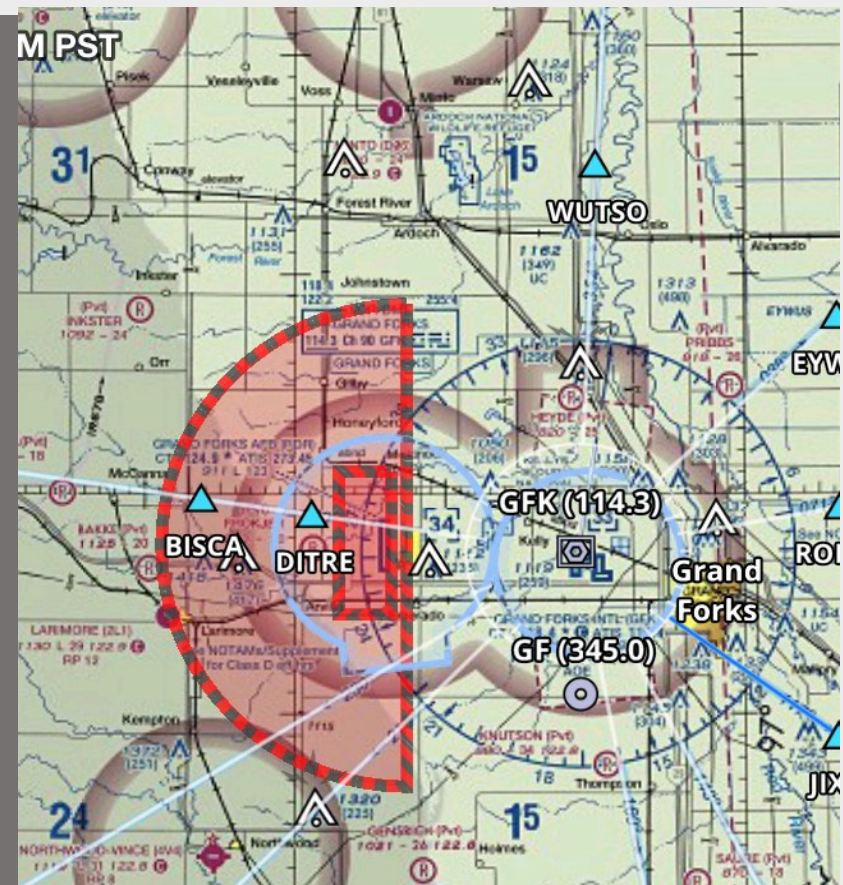
- Part 107
- Section 333 Exemption
- COA
- COTS waiver



External Support (“Ecosystem”)

- Existing tenants
- Local residents
- Local/state government (tax incentives?)
- The “*Competition*”
- Other supporting industries
- Intermodal transportation/transfer hub (shipping, rail, communications, data)
- Federal government
- Political and citizen support at all levels

An aerial photograph of a large airport complex. A long, light-colored runway or taxiway runs diagonally from the bottom left towards the top right. To the right of this main strip, there is a large, rectangular terminal building with a flat roof. Further to the right, there are several smaller, more complex buildings, possibly hangars or administrative structures. The surrounding landscape is a mix of green fields, some of which appear to be agricultural, and some areas that look like parking lots or undeveloped land. The overall scene is captured from a high angle, looking down on the airport and its surroundings.



Ennis Municipal (F41)



- Ennis Municipal Field (F41)

FBO	
City of Ennis	100LL \$3.12 Jet A+ \$2.89 >
(972) 875-4279	
122.9 UNICOM	
AIRCRAFT MAINTENANCE / SERVICES	
Hammock Aviation Services	>
(972) 875-4279	
122.9 UNICOM	
OTHER	
Poplawski Aircraft Painting	>
(972) 875-2111	

ELLINGTON (See HOUSTON on page 321)

ENNIS MUNI (F41) 2 W UTC-6(-5DT) N32°19.78' W96°39.83'

500 B NOTAM FILE FTW

RWY 16-34: H3999X50 (ASPH) S-18 MIRL

RWY 16: REIL. PAPI(P2L)—GA 3.0° TCH 35'. Ground. Rgt t/c.

RWY 34: REIL. PAPI(P2L)—GA 3.0° TCH 35'. Thld dsplcd 255'. P-line.

SERVICE: S4 FUEL 100LL, JET A LGTACTVT REIL RWY 16 and 34;
PAPI RWY 16 and 34; MIRL Rwy 16-34, preset low INTST—CTAF.

AIRPORT REMARKS: Attended Mon-Fri 1400-2300Z+. Fuel avbl 24 hrs with major credit card. Birds on and invof arpt. Parachute Jumping.

AIRPORT MANAGER: (972) 875-4279

COMMUNICATIONS: CTAF 122.9

® REGIONAL APP/DEP CON 125.2

CLEARANCE DELIVERY PHONE: For CD ctc Regional Apch at 972-615-2799.


RADIO AIDS TO NAVIGATION: NOTAM FILE FTW.

CEDAR CREEK (L) VORTACW 114.8 CQY Chan 95 N32°11.14' W96°13.09' 285° 24.3 NM to fld. 400/6E.

DALLAS-FT WORTH
L-17C, A
IAP

Ennis Municipal (F41)



**Hammock Aviation Services**
3002 W. Ennis Avenue
Alvin, Texas 77512
08:00 A.M. TO 05:00 P.M. Mon-Fri

Info Fees Comments

CONTACTS

UNICOM	122.9
Phone (Main)	(972) 875-4279
Phone (Fax)	(972) 878-8505

AMENITIES

Pilot's Lounge, Restrooms

SERVICES


Aircraft Hangars, Aircraft Maintenance


FUEL

CREDIT CARDS




AVCARD, Visa, Mastercard, US Bank Multi Service, American Express

Sprint 12:04 PM 65%

**Poplawski Aircraft Painting**

**Poplawski Aircraft Painting**
ENNIS AIRPORT
2162 OLD WAXAHACHIE ROAD
ENNIS, TX 75119
8am-5pm Mon-Fri (Local Time)

Info Fees Comments

CONTACTS

Phone (Main)	(972) 875-2111
--------------	----------------

SERVICES

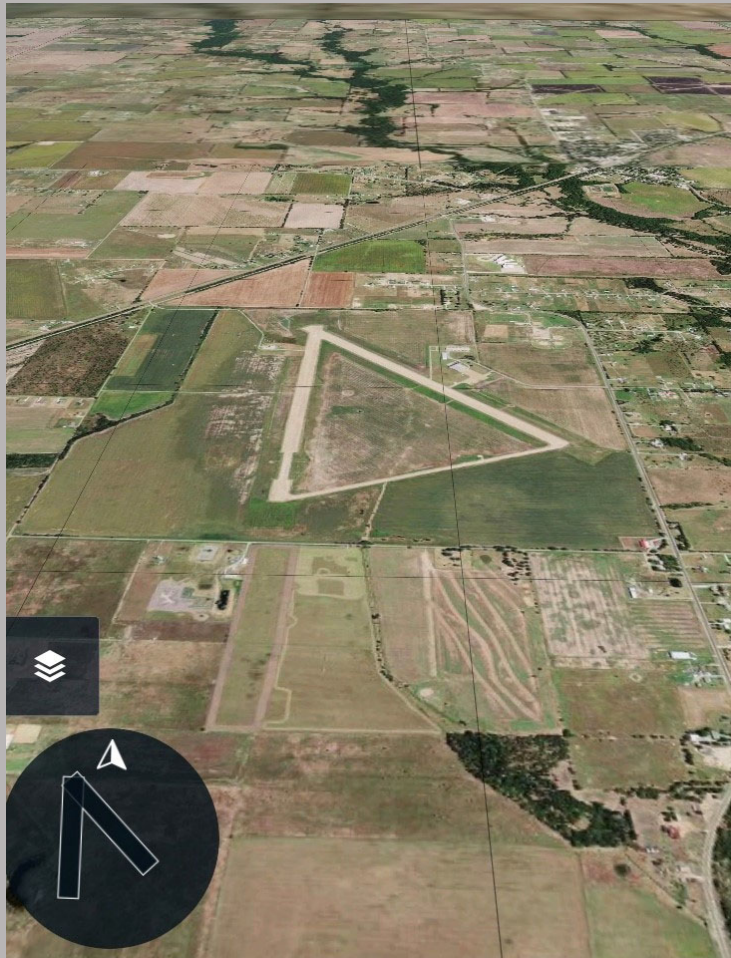
Aircraft Maintenance

Add Comment Update Fuel Prices

- toeknee25** 3 months ago
Departing, contact approach ASAP. They will either get you a squawk and then almost immediately transfer you over to another freq. OR tell you to contact another controller
- cecstl** 4 months ago
Very well maintained runway. If strong gusting winds, watch for wind shear near the ground on south approach. Watch for Ag crop aircraft and parachuting operations here.
- andy65** 1 year 4 months ago
A nice local airport. Friendly people. Bought fuel. No tie down charge even though I stayed more than one night.
- flexvince** 1 year 7 months ago
Parachute activities on the airport.
- wizzrd02** 4 years ago
For south or east approach/departure use 126.72

Caddo Mills Municipal Airport (7F3)

INNOVETS



Caddo Mills Municipal Airport (7F3)



FBO

Caddo Mills Municipal Airport
 4096 FM 1565
 Caddo Mills, TX 75135
 Mon-Sat 8:00 am-6:00 pm
 Sun Noon-5:00 pm

Info

Fees

Comments

📞

↕

✉

RETAIL PRICES (---)	SELF	FULL
100LL	None	None
Jet-A	None	None
Jet-A+	None	None

CONTACTS

Phone (Main)	(972) 974-4779
--------------	----------------

aaron

2 years 4 months ago

No GA fuel, terminal or FBO. There is a large building that appears to be an FBO terminal adjacent to the GA Ramp, but it is privately owned. Airport is primarily used for touch and go's and the parachute operation on the West side.

yourpilotincommand

2 years 7 months ago

Flew over this evening and noticed pilot controlled runway lighting inop.

hkbarret

6 years 4 months ago

No sailplane activity. Parallel grass runway no longer active.

dginther

9 years 5 months ago

Cc auth is down for fuel, so assisted fuel only. Good fuel prices, but I question to accuracy of the pump as we took 17 gallons to the tab of a pa28, even though there was fuel in the tank. No more glider operations. Both runways active and in reasonable shape.

A/FD

TEXAS 257

CADDO MILLS MUNI (7F3) 2 SW UTC-6(-5DT) N33°02.17' W96°14.59'
 542 B NOTAM FILE FTW
 RWY 13-31: H4000X150 (CONC) S-26
 RWY 13: Tree.
 RWY 31: Tree.
 RWY 18-36: H4000X75 (CONC) S-26 MIRL
 RWY 18: Tree.
 RWY 36: Tree.
SERVICE: LGT ACTIVATE MIRL Rwy 18-36—CTAF.
AIRPORT REMARKS: Attended Mon-Sat 1500-0000Z. For arpt attendant other times, call 214-585-9953. Parachute Jumping. Skydiving activity on arpt. Rocket launch area adj to bxy east of Rwy 13-31, midway. Rwy 13-31, 18-36 markings faded. Ramp on east-side of Rwy 13-31 in poor condition.
AIRPORT MANAGER: 214-585-9953
COMMUNICATIONS: CTAF/UNICOM 122.8
® FORT WORTH CENTER APP/DEP CON 132.025
CLEARANCE DELIVERY PHONE: For CD ctc Fort Worth ARTCC at 817-858-7584.
RADIO AIDS TO NAVIGATION: NOTAM FILE FTW.
BONHAM (H) VORTACW 114.6 BYP Chan 93 N33°32.25' W96°14.05' 175° 30.0 NM to fld. 700/6E.
COMM/NAV/WEATHER REMARKS: UNICOM not monitored.

DALLAS-FORT WORTH

L-170, A

IAP

CAIN (See SLIDELL on page 402)

Discussion...

Questions?

Chris Yakabe

chris@innovets.net

Mike Whitted

Mike@innovets.net

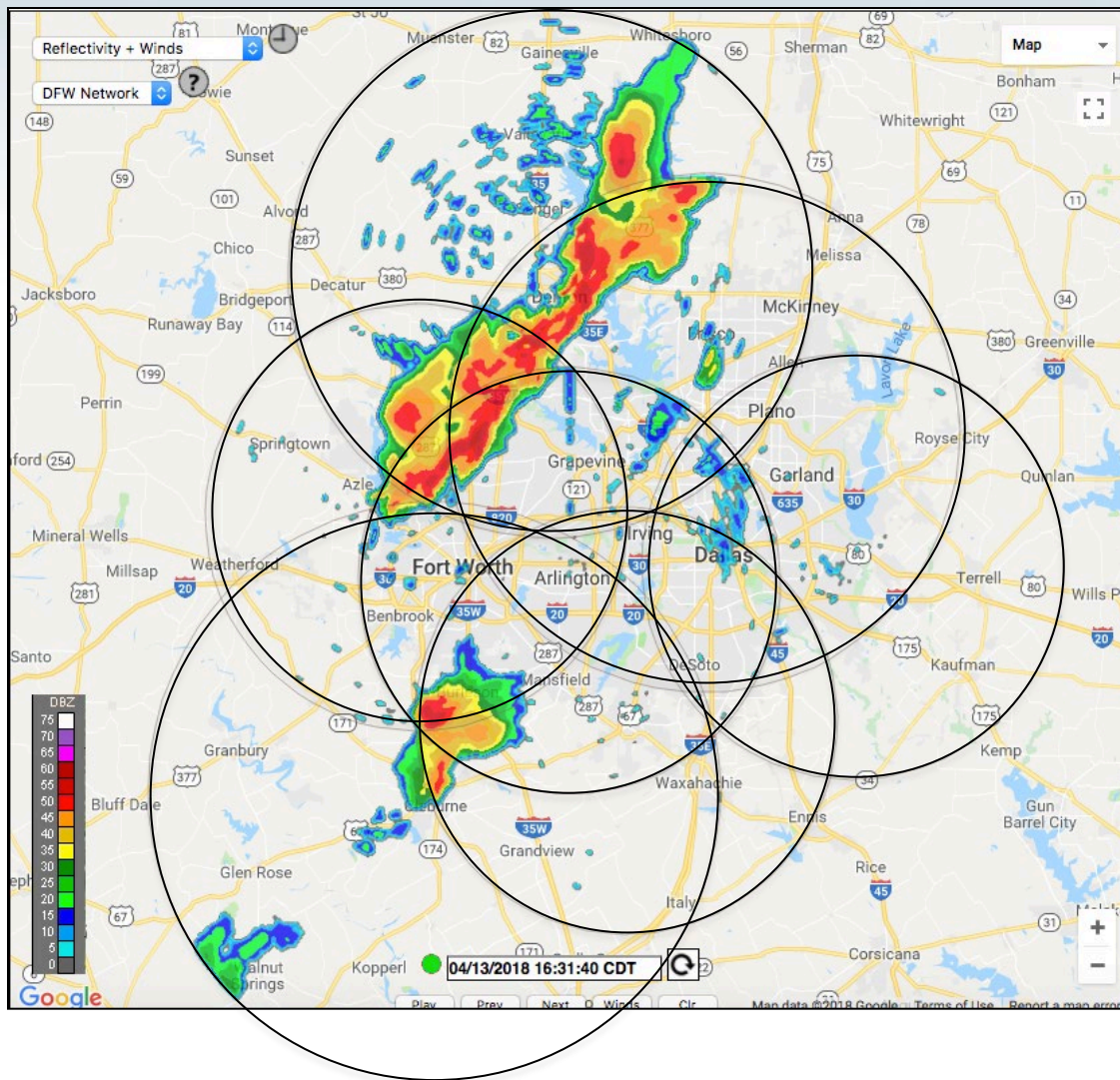
Thank You for your Time!

CASA North Texas Aviation Weather Testbed

ATTAC Update

December 3, 2020





- CASA X-Band Weather Radar Network operational since 2012
- **Only network of its kind in the country**
- Regional project, led by NCTCOG, supported through funding from 50 NTX cities and towns, research grants

North Central Texas cities and towns provided the resources for installation and operation of radar network



University of
North Texas



Johnson
County



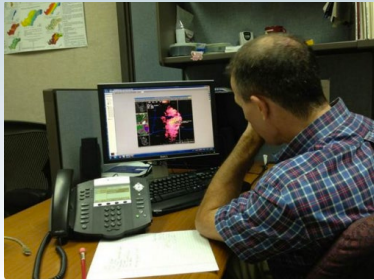
City of
Addison



DFW Airport Warehouse Space

Community sponsored installations





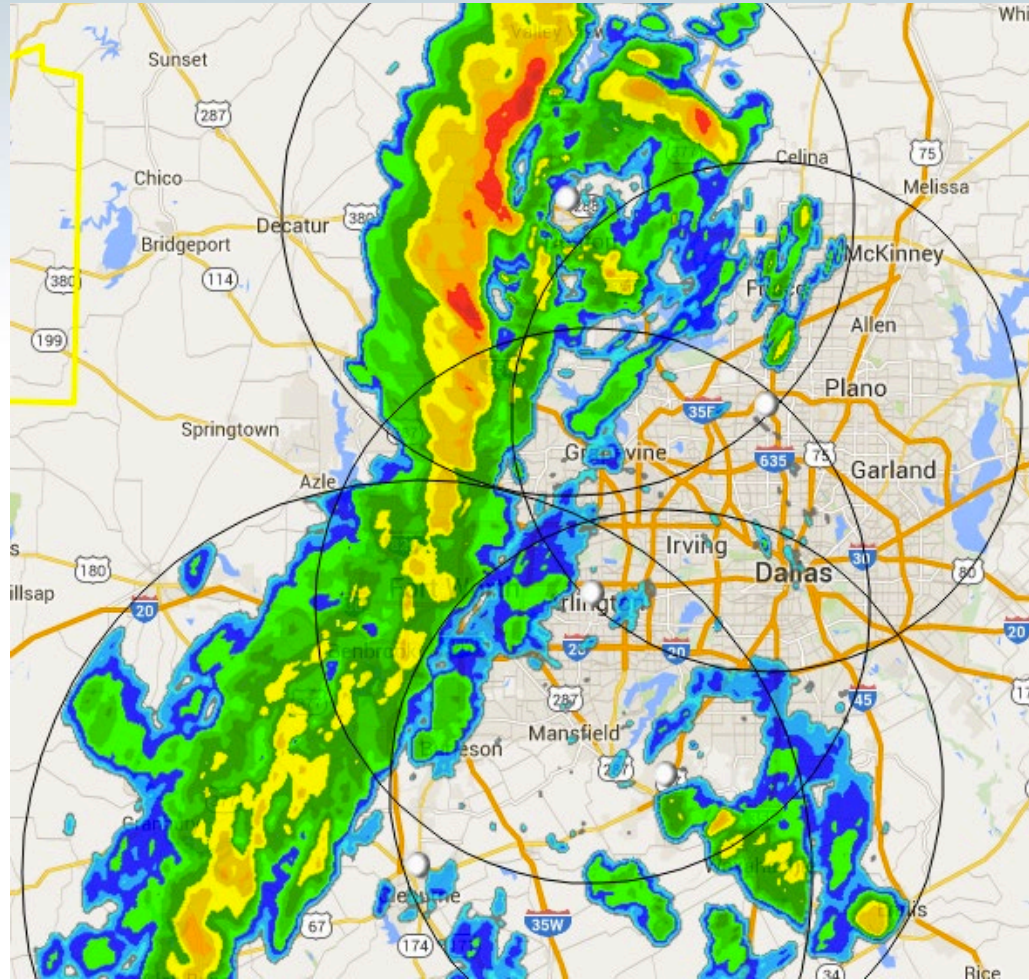
NWS WFO



Emergency
Management



Storm Water
Management



Media



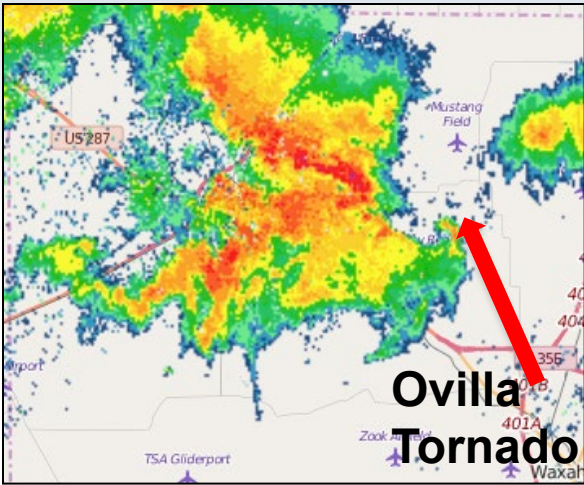
Aviation



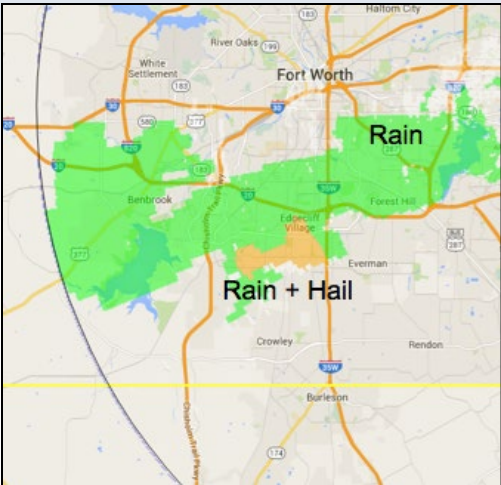
Utilities /
Telecom



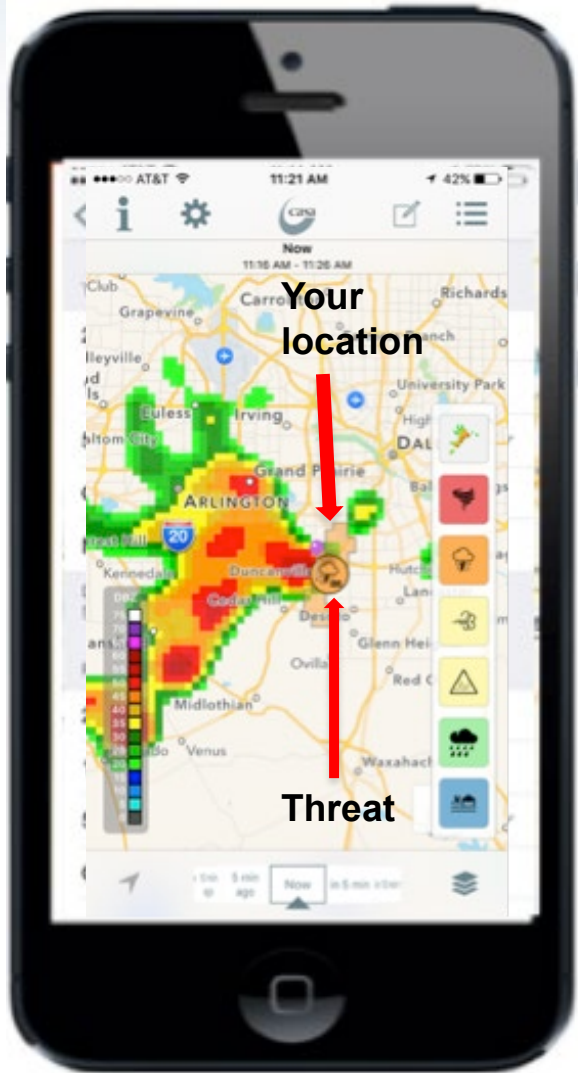
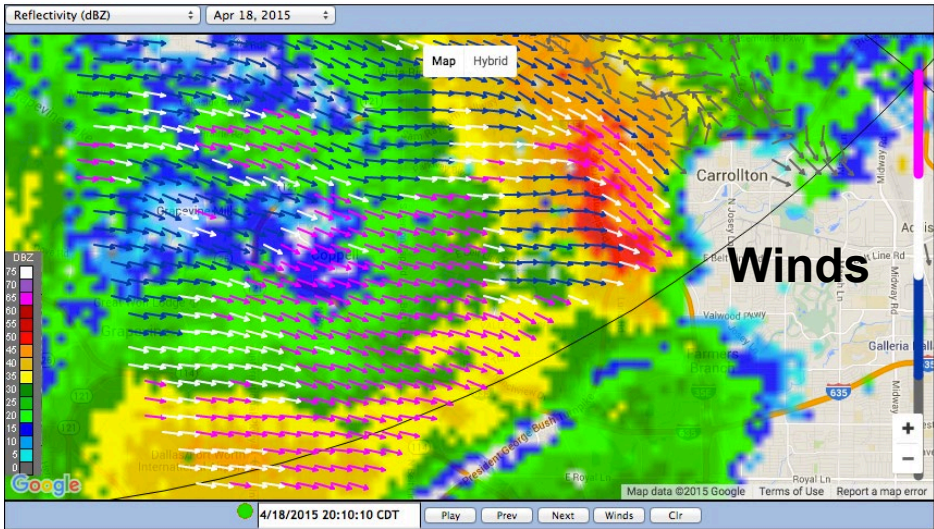
High resolution radar imagery, one minute updates on website and hazard alerting app



Storms



Rain & Hail

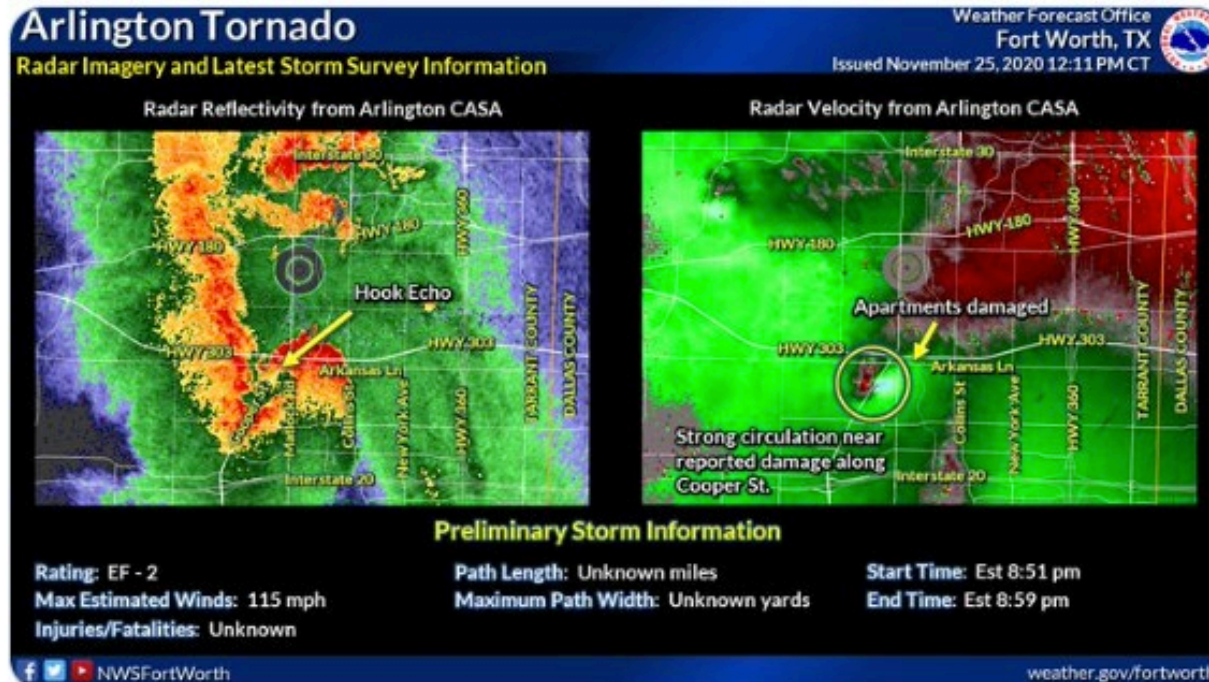




NWS Fort Worth
@NWSFortWorth

...

12:17 PM: Our survey team has found EF-2 damage in south Arlington, near Pioneer Pkwy & S Center St. Estimated max winds of 115 mph. We will have more information on the path length and width later today. Here's a snapshot of the radar last night. [#dfwx](#)
[#ctxwx](#)

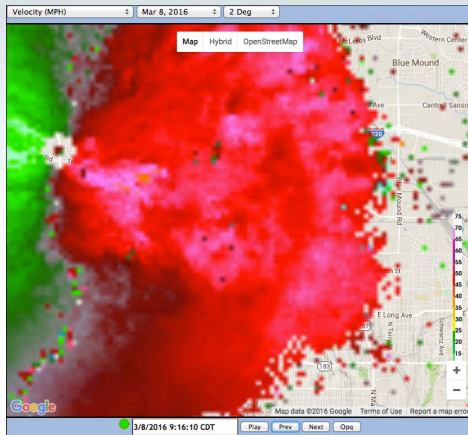


1:19 PM · Nov 25, 2020 · TweetDeck

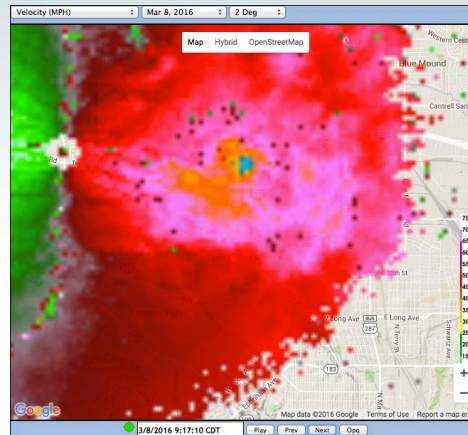
249 Retweets 90 Quote Tweets 539 Likes



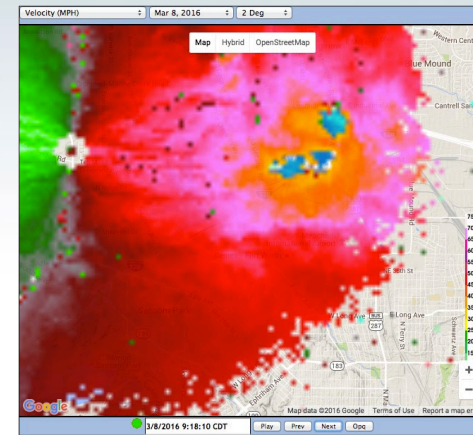
How do CASA radars help airport managers?



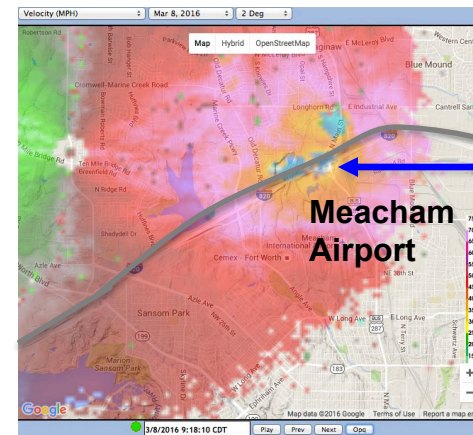
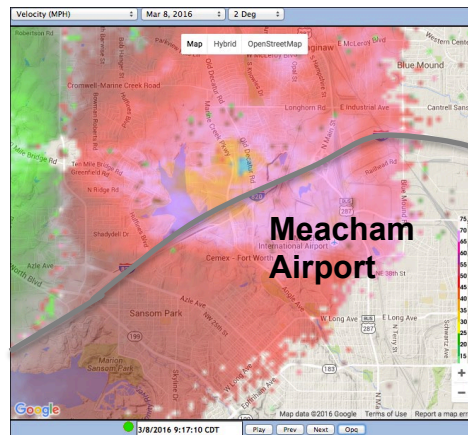
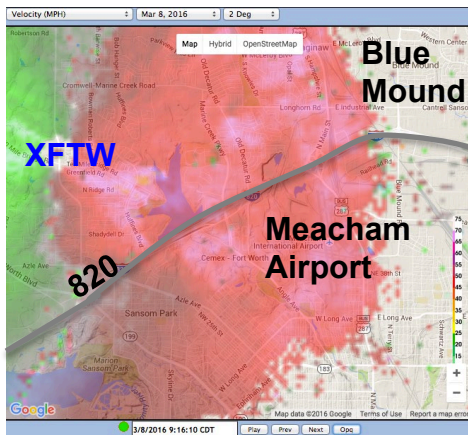
09:16 am



09:17 am



09:18 am



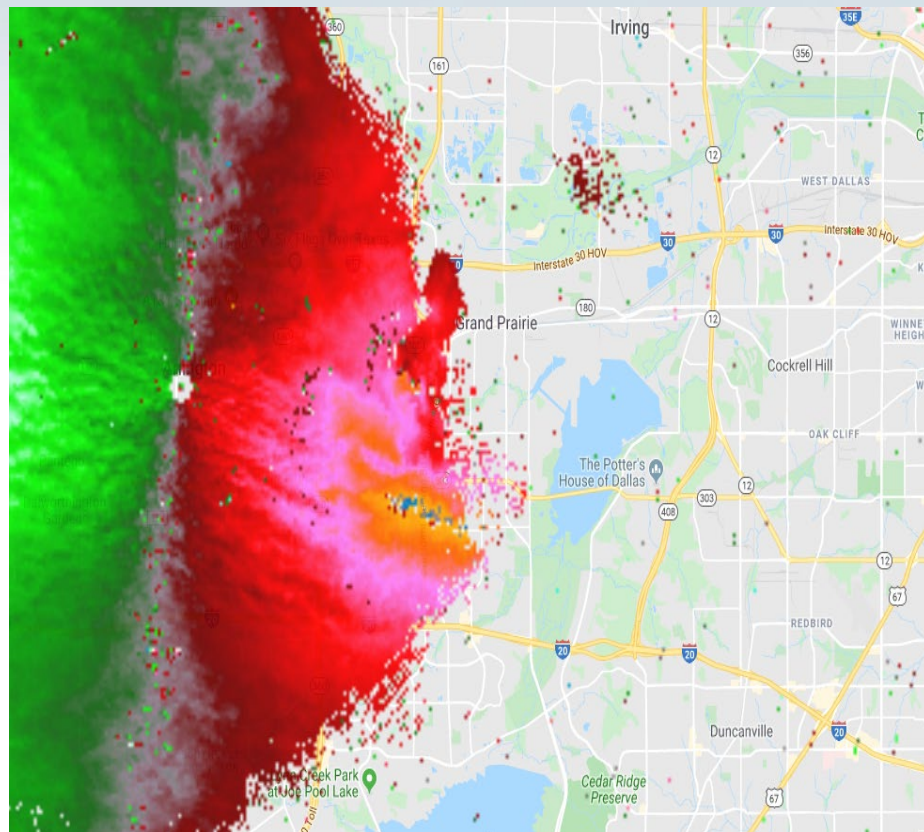
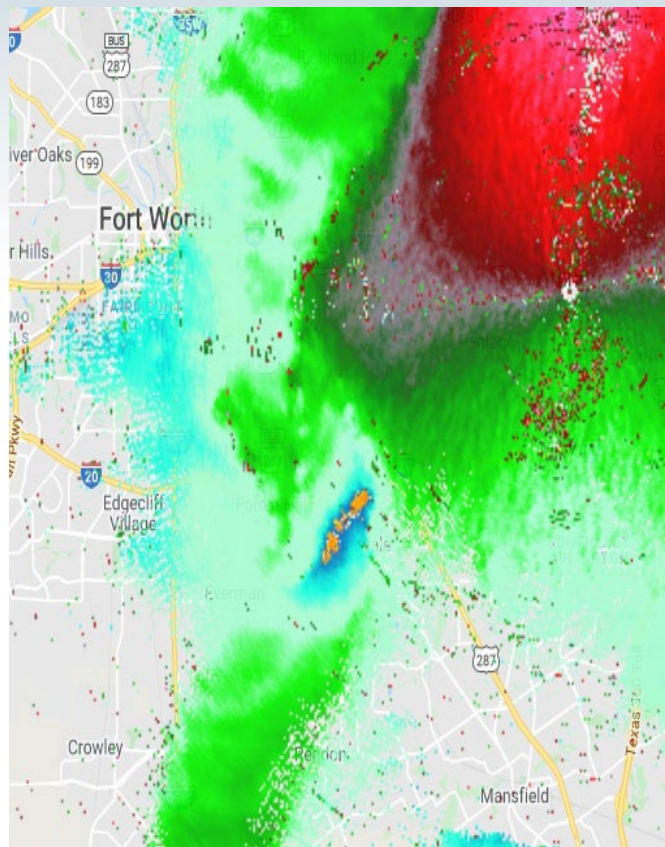
Hangar
Damage

High resolution radar velocity images help pinpoint high wind threats to airport tenants.
Case Study: March 8, 2016. Strong winds caused the roof of one hangar to be blown off and another one to get damaged, north end of Meacham International Airport. CASA provided archived **radar velocity data to pinpoint** location of strongest winds within the storm.





March 13th Squall Line Event 2019

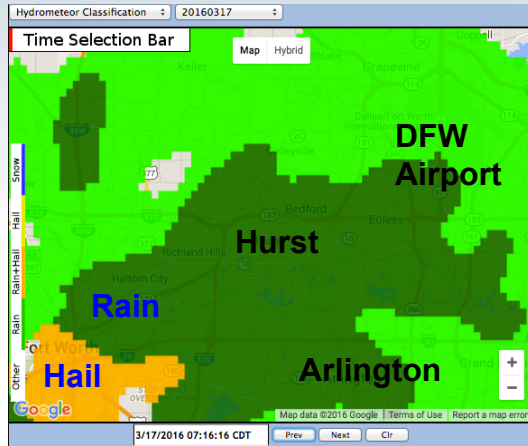


“Widespread swaths of wind damage...a complete field survey would have taken days.

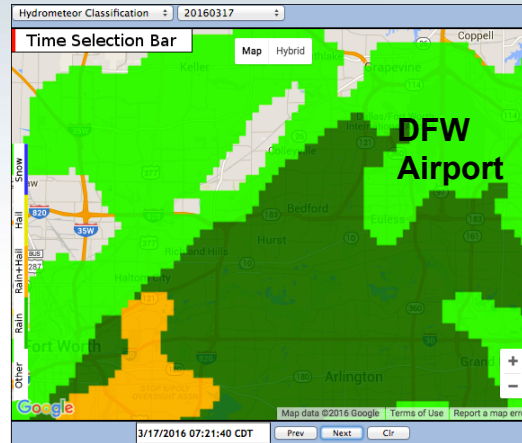
No field storm surveys were performed, based on CASA data not showing any areas tight rotation. Straight-line wind speeds estimated from pictures and observations.” - NWS



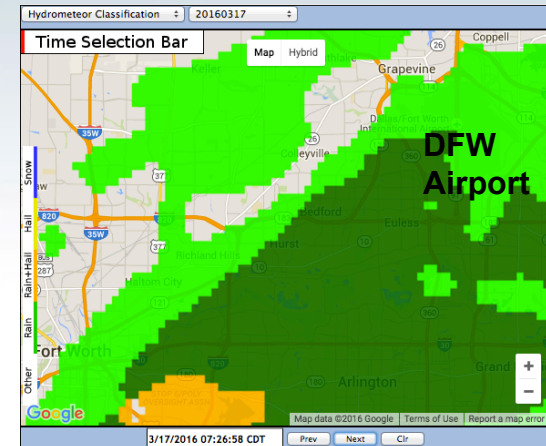
How do CASA radars help airports?



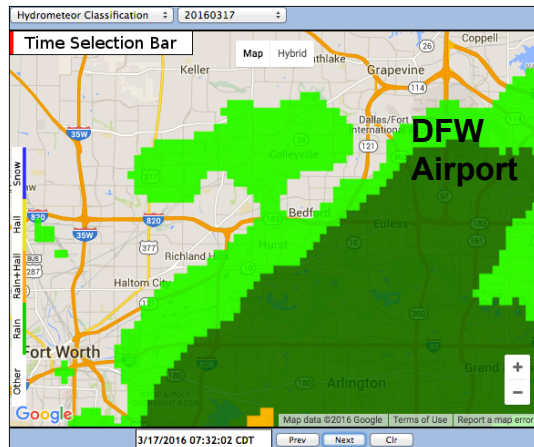
07:16 am



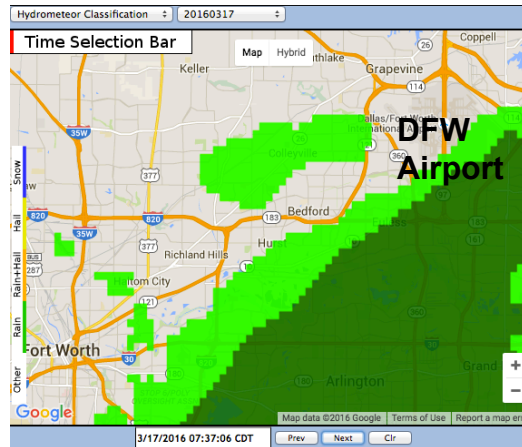
07:21 am



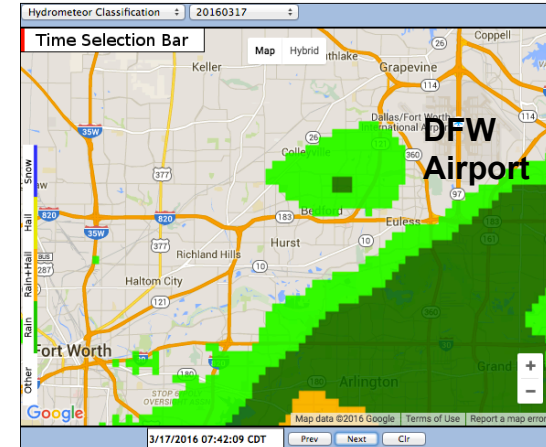
07:26 am



07:32 am



07:37 am



07:42 am

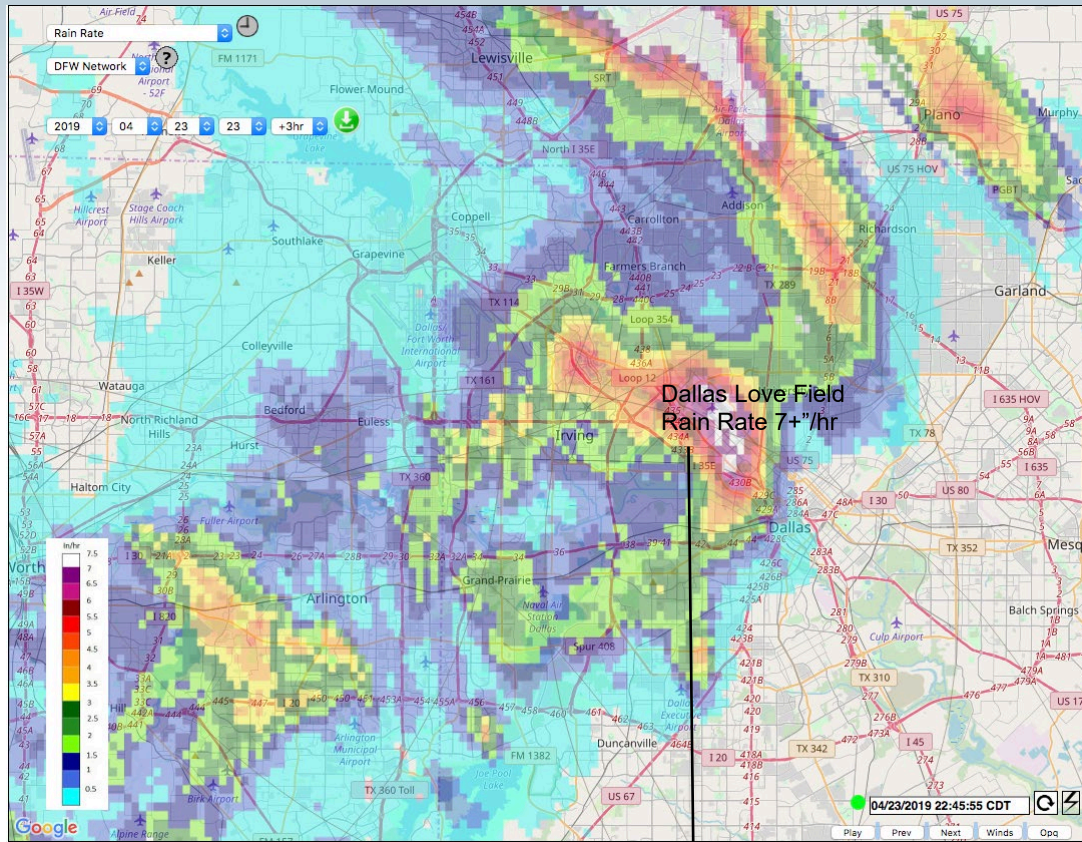
Hail product helps airport operations personnel prepare for impact. **Case Study:** March 17, 2016. Hail storm damage reported widely across the Metroplex. Airport Duty Manager continuously monitored the CASA hail product during the entire event and was able 'to alleviate the fear that the airport itself was going to be impacted by the hail'.



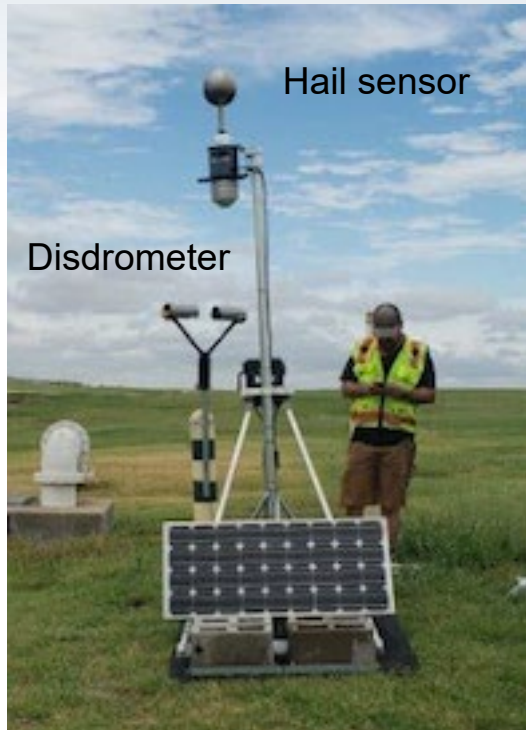
April 23, 2019 Floods

“CASA QPE data was used to make warning decisions for flash flooding. There were technical issues with MRMS data that night so it was not available. WSR-88D underestimated the rainfall. **CASA QPE data was nearly perfect** and led to the issue of a flash flood warning near Lake Lavon where a rain gauge report later verified the 8+ inches.”

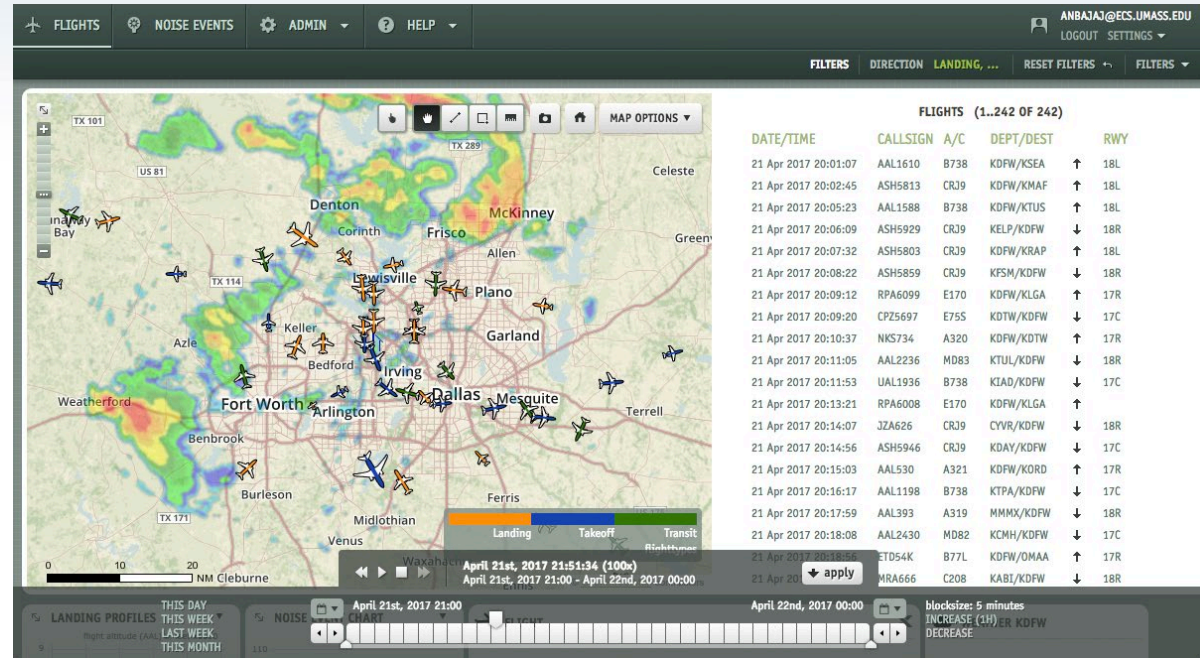
--Ted Ryan, SOO, NWS Fort Worth



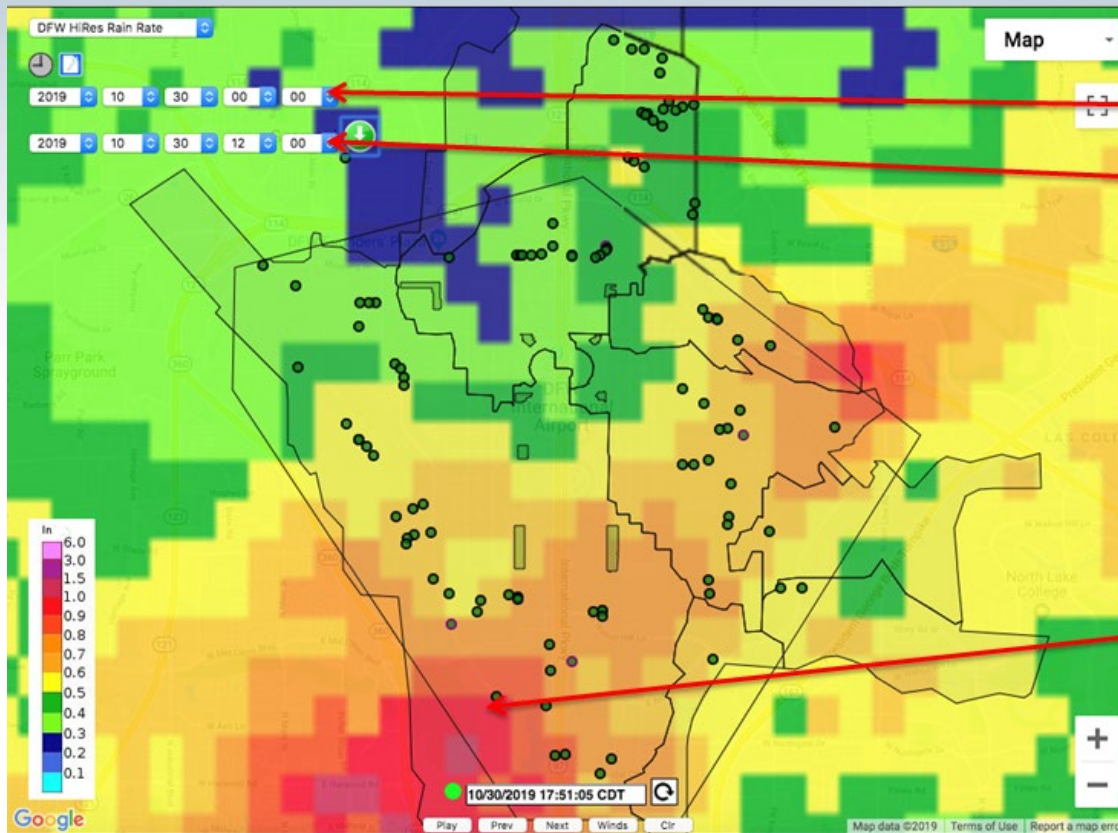
Ongoing project with DFW International Airport project



Instruments installed at
DFW Airport SE Holdpad



Noise complaint management



Start time

End time

Rainfall
accumulation
tool

Outfall accumulation
and flow
measurements



Outfall



Testing



Winter Weather Collaboration Meeting, DFW
Airport Operations Center, Dec. 22, 2015

Working towards **winter weather decision products**
and integration into the **new IOC**

Severe Weather Impact on Advanced Air Mobility applications



Orbs/ Air Taxis / Urban Air Mobility (UAM)
P/C Uber Elevate Network Aircraft partners



Winds
P/C Fox4 News



Hail
P/C Fox4 News

SEVERE WEATHER Impacts

On the Ride

- Passenger/Cargo Safety
- Passenger Comfort

On the Operations

- Reliability of service
- Efficiency of operations

On Vertiport Infrastructure

- Vehicle safety
- Passenger safety

Regional Advanced Air Mobility (AAM) Projects



Copyright 2020 Bell Textron Inc.

NASA Systems Integration & Operationalization (SIO) projects with Bell

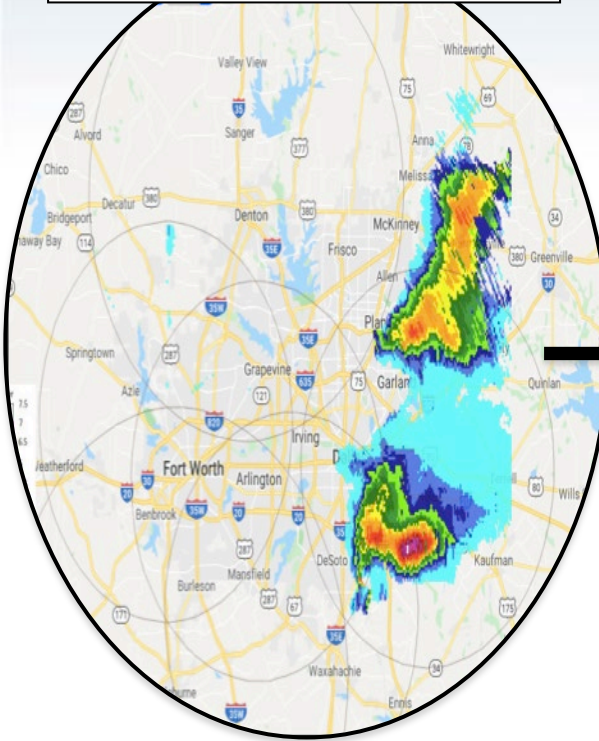


NASA AAM National Campaign

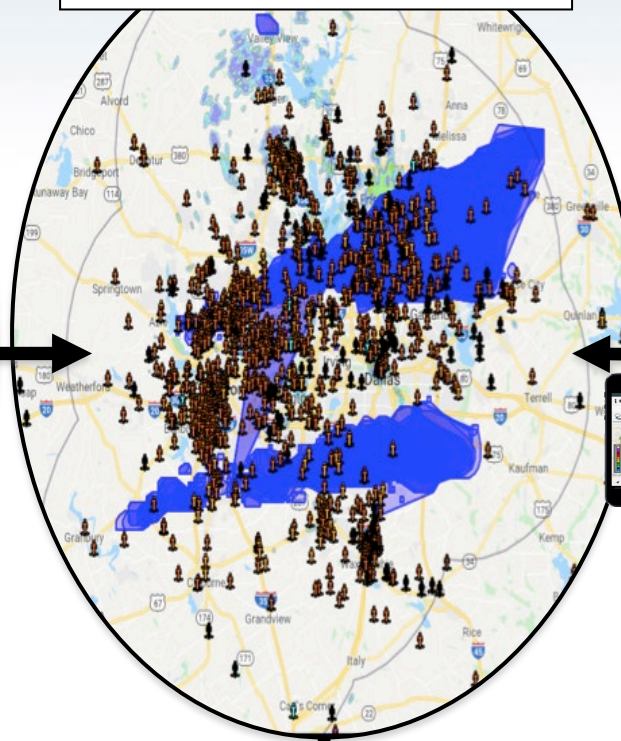


City Warn: Context-Aware, Targeted Warning

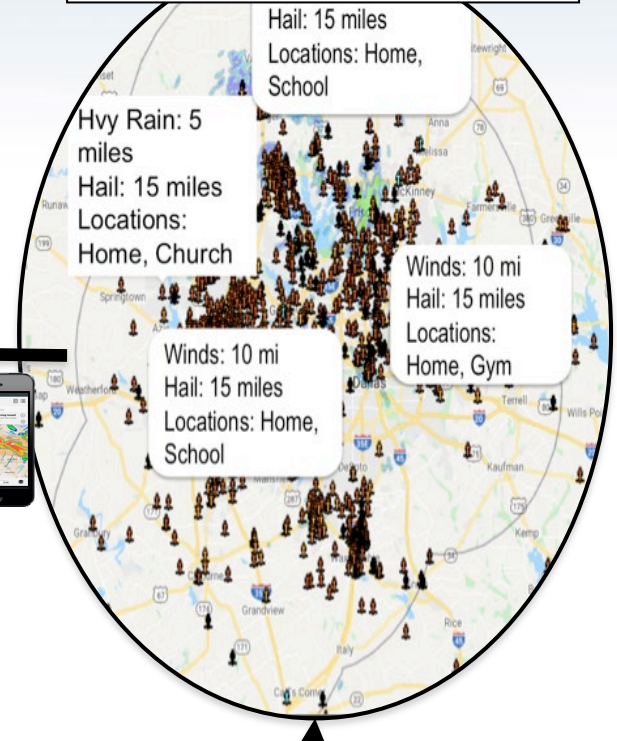
Environmental &
Infrastructure Threats



CityWarn:
Threat Extraction & Alert
Generation



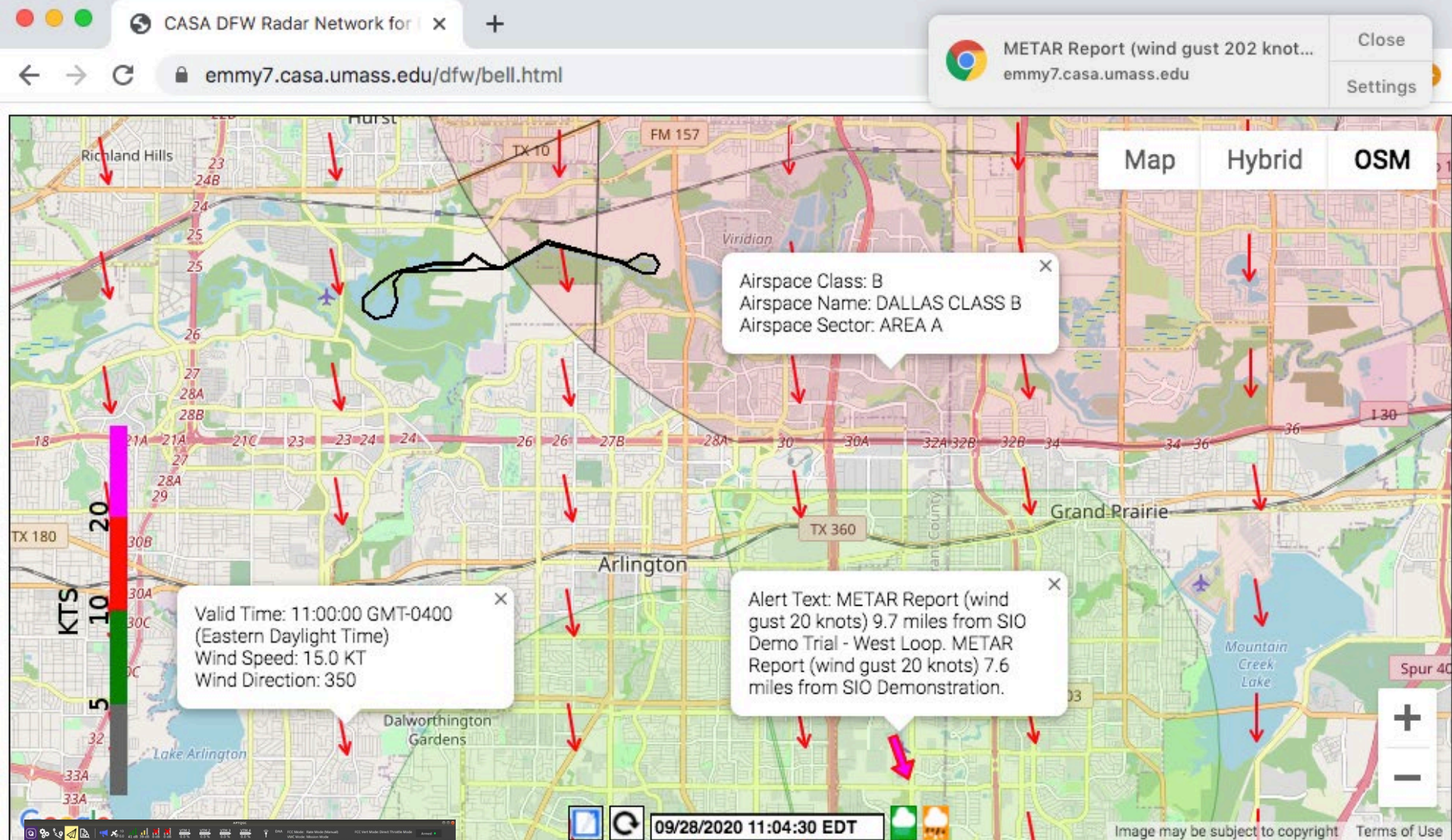
People: locations, contexts,
preferences



Alerts

Surveys

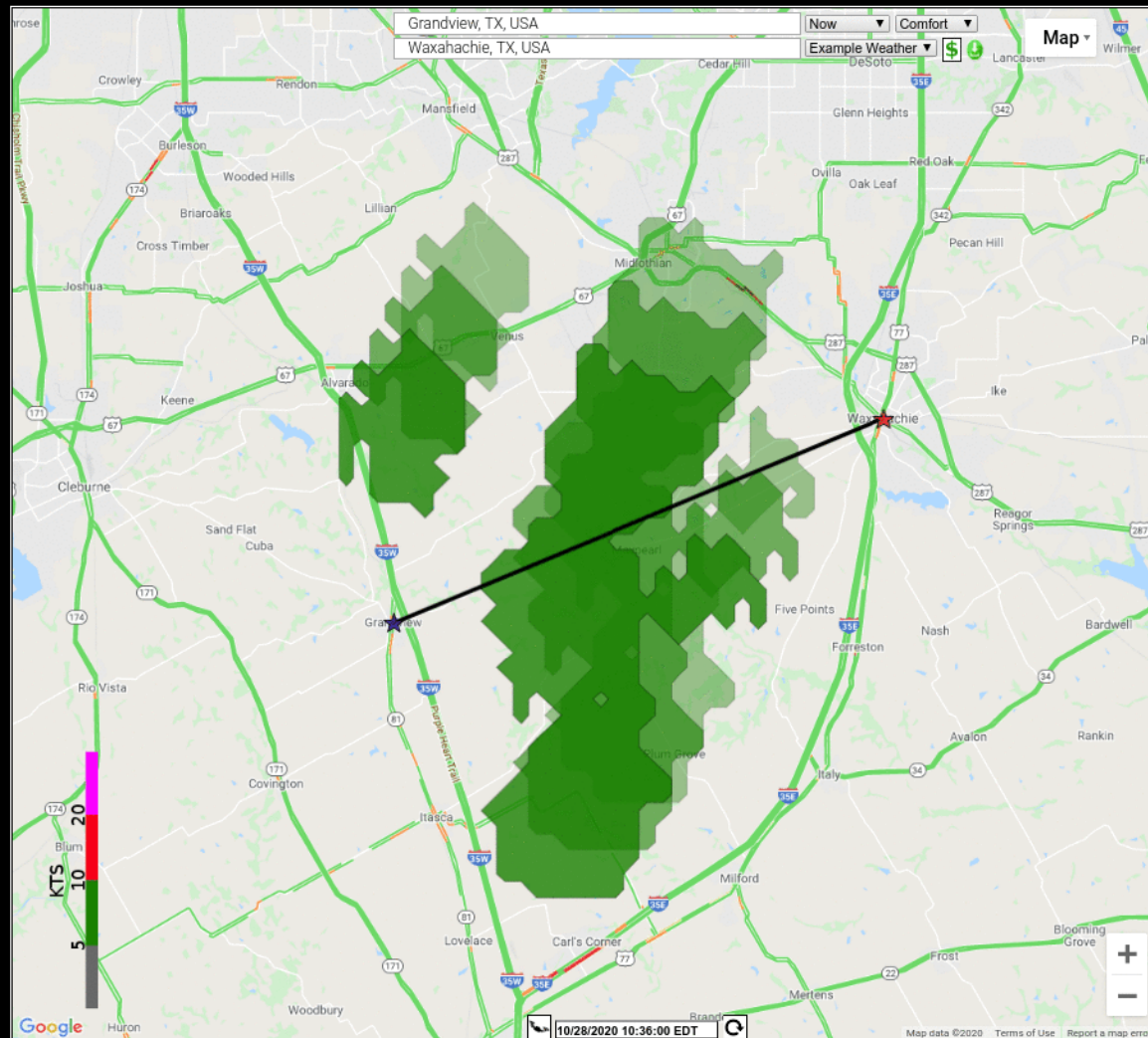




Integration with Bell's Ground Control Software



Copyright 2020 Bell Textron Inc.



Dynamic route planning of drones around weather hazards based on short-term (5, 15 minute) radar-based weather forecasts (UMass internal research funded project)

Drone operator weather needs assessment

- North Central Texas Council of Governments UAS Safety & Integration Taskforce, Public Safety Unmanned Response Team
- Interviewed 15 public safety and commercial drone operators.
- Missions, training, weather impacts, alerting needs, training



Flood rescue

(P/c North Texas Public Safety Unmanned Response Team)



2019 Dallas crane collapse



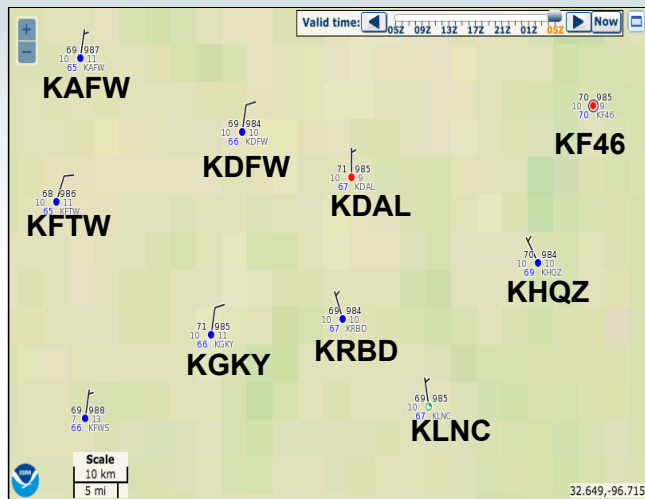
Roof moisture detection

(P/C: Tarillo Vue)

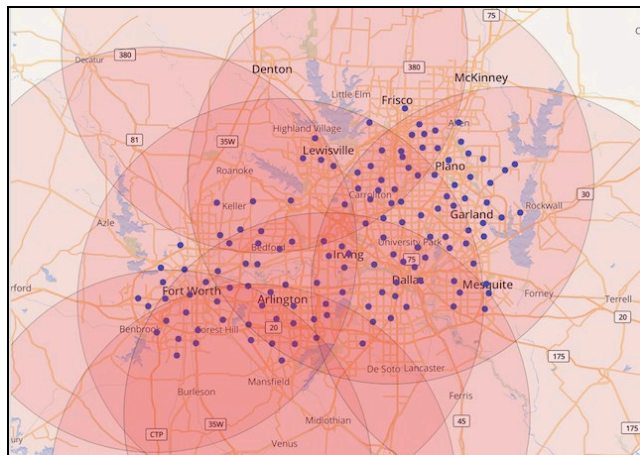
“Can I fly **higher or lower** / differently and complete my mission? What are the **winds at different heights**?”

“Rain will ruin photos/ videos. Tell me if **rain fell in the last 24 hours**; if **surfaces are wet** (roof/ solar panel inspections).”

Availability of Wind Data across the Dallas – Fort Worth Metroplex



ASOS/AWOS surface stations



Earth Networks weather stations

Wind Data availability

ASOS/AWOS stations (METARS)

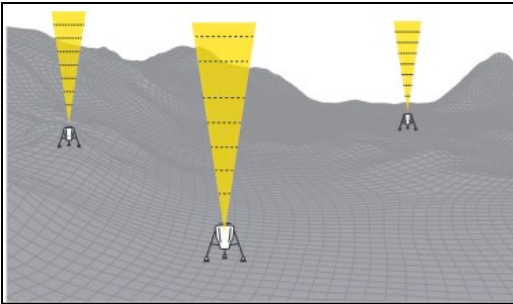
- Surface winds only
- Update hourly
- Only at airports

Commercial Weather stations

- Surface winds only
- Not integrated into drone apps
- Apps do provide **wind forecasts** based on model data

North Central Texas blind to real-time observations of wind between 10 and 1500 feet!

Need instruments to measure winds at low altitudes



NRG Systems 'Spidar' Direct
Detect Lidar
Wind Vertical Profiles
Measurement height range: 20-
200 m

Vaisala (Leosphere) 'Windcube'
Scanning Wind Doppler Lidar
Wind measurement volume:
12km x 12km x 300m,
Resolution: 200m x 200m x 50 m

'Meteodrone'
Automated weather
data collection using
drones up to 3 km

Collaboration opportunities

- Infrastructure partners (lidar deployments)
- Custom decision making products at airports (similar to DFW Airport projects)
- Joint proposal writing (e.g. NASA ACO)
- Regional/ transportation funding for shared infrastructure

Contacts

Molly McFadden, NCTCOG Emergency Preparedness

Natalie Bettger & Ernest Huffman, NCTCOG Transportation

Amanda Everly, CASA DFW Project Manager

Brenda Philips & Apoorva Bajaj, CASA, UMass Amherst



NCTCOG McKinney Airport Funding

COLLIN COUNTY FUNDING EXCHANGE

- NCTCOG continues to work with TxDOT and local government partners on the development of the US 380 project in Collin County.
- Both the US 380 and the North/South Roadway projects are critical to the RTC's implementation of the Regional 10 Year Plan in Collin County
- This proposal seeks to address two impacts that the future US 380 and associated connections to it will have.
- The partnership would only be needed if US 380 is constructed as a freeway.

PROPOSED PANTHER CREEK PARKWAY FUNDING PARTNERSHIP

- In order to prevent a water line relocation that runs through Frisco, TxDOT has proposed an alignment change for US 380 that reduces developable land in Frisco.
- In exchange for agreeing to this alignment change, Frisco has requested \$30M to fund an extension of Panther Creek Parkway from Preston Road to the Dallas North Tollway.
- Collin County would like to fund this improvement, but bond funds are not eligible for this project, and the County proposes the following:
 - Collin County has requested a funding exchange with the RTC
 - The RTC would fund the Panther Creek project with \$30M of STBG funding.
 - In exchange, \$30M of Category 2 funds would be taken off the US 380 project and would be replaced with \$30M of Collin County Bond funds.
- Costs above and beyond this \$30M on the Panther Creek Parkway project would be the responsibility of Frisco.

PROPOSED MCKINNEY AIRPORT FUNDING PARTNERSHIP

- McKinney has received a \$15M TxDOT grant for a runway extension at McKinney National Airport , which was originally planned to be extended to the south.
- Extending the runway to the north would reduce impacts to neighboring cities and give more flexible alignment options for the future extension of Spur 399 to US 380.
- An extension to the north will cost more than to the south.
- Collin County is willing to cover this cost, but cannot utilize bond funding on the project, so another funding exchange is being proposed.
 - The RTC would use \$30M of Regional Toll Revenue (RTR) funds to offset costs of the northern runway extension (as mitigation to the US 380 project)
 - In return, \$30M of Category 2 funding will be removed from the US 380 project and be replaced with \$30M of Collin County Bond funding.

Contact

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Air Transportation Advisory Committee

December 3, 2020



NCTCOG Aviation Planning Program
Area Update

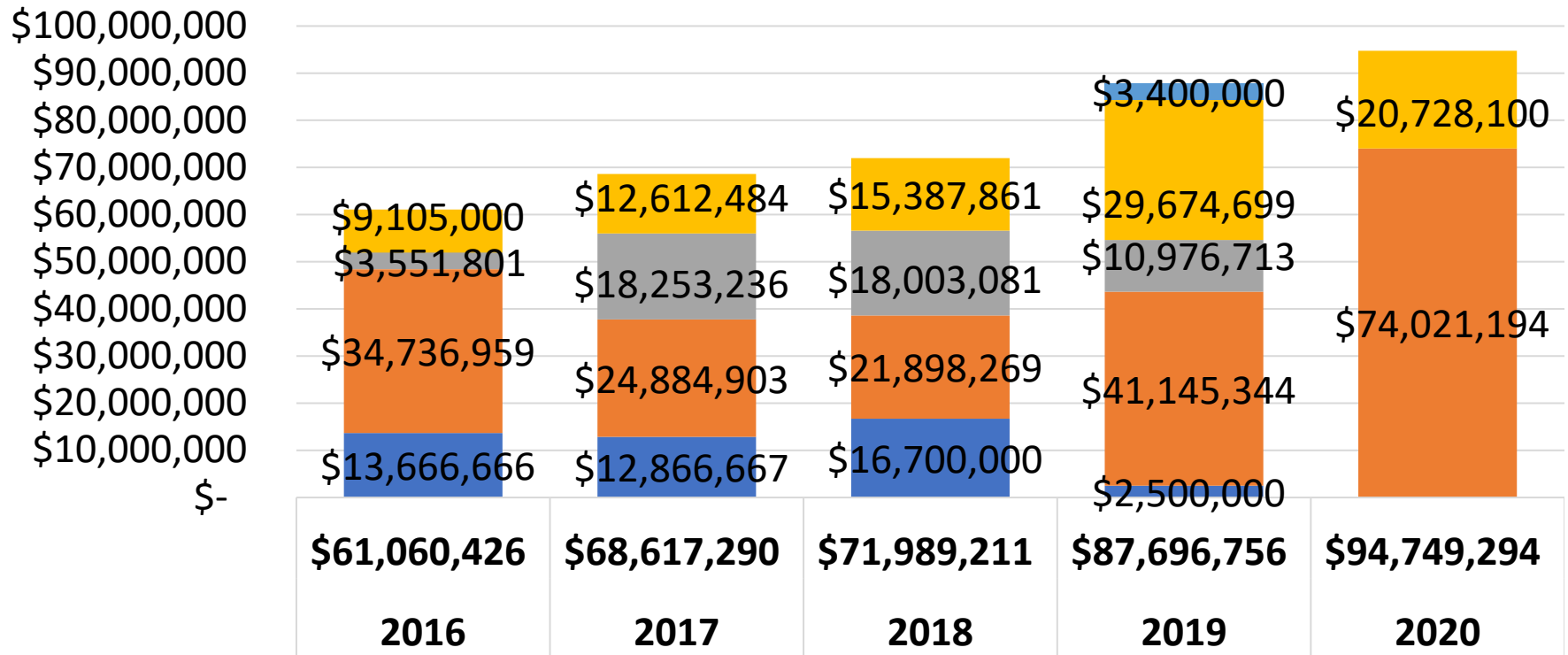
Regional Airport Funding



Texas

Annual Funding Comparison

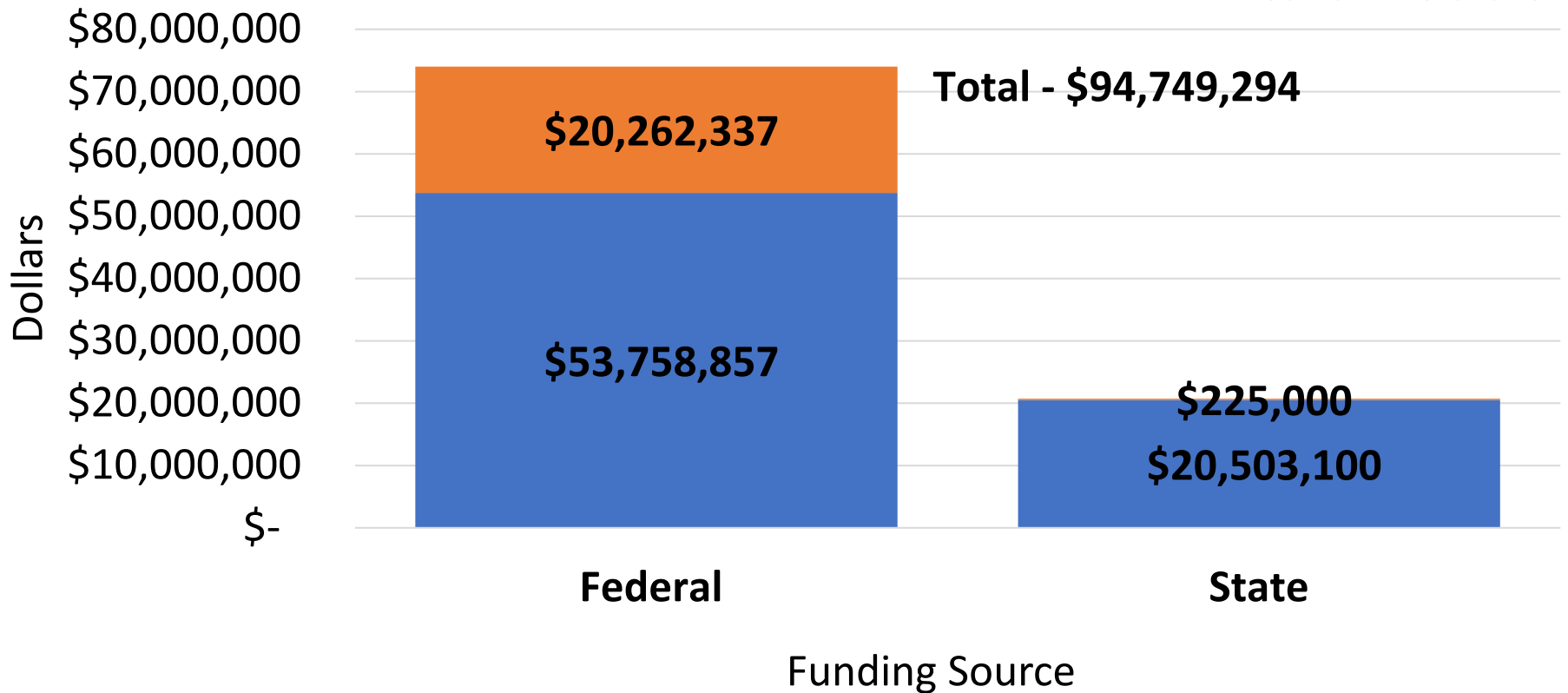
■ Discretionary ■ Federal ■ NPE ■ State ■ Omnibus



Grants by Funding Source

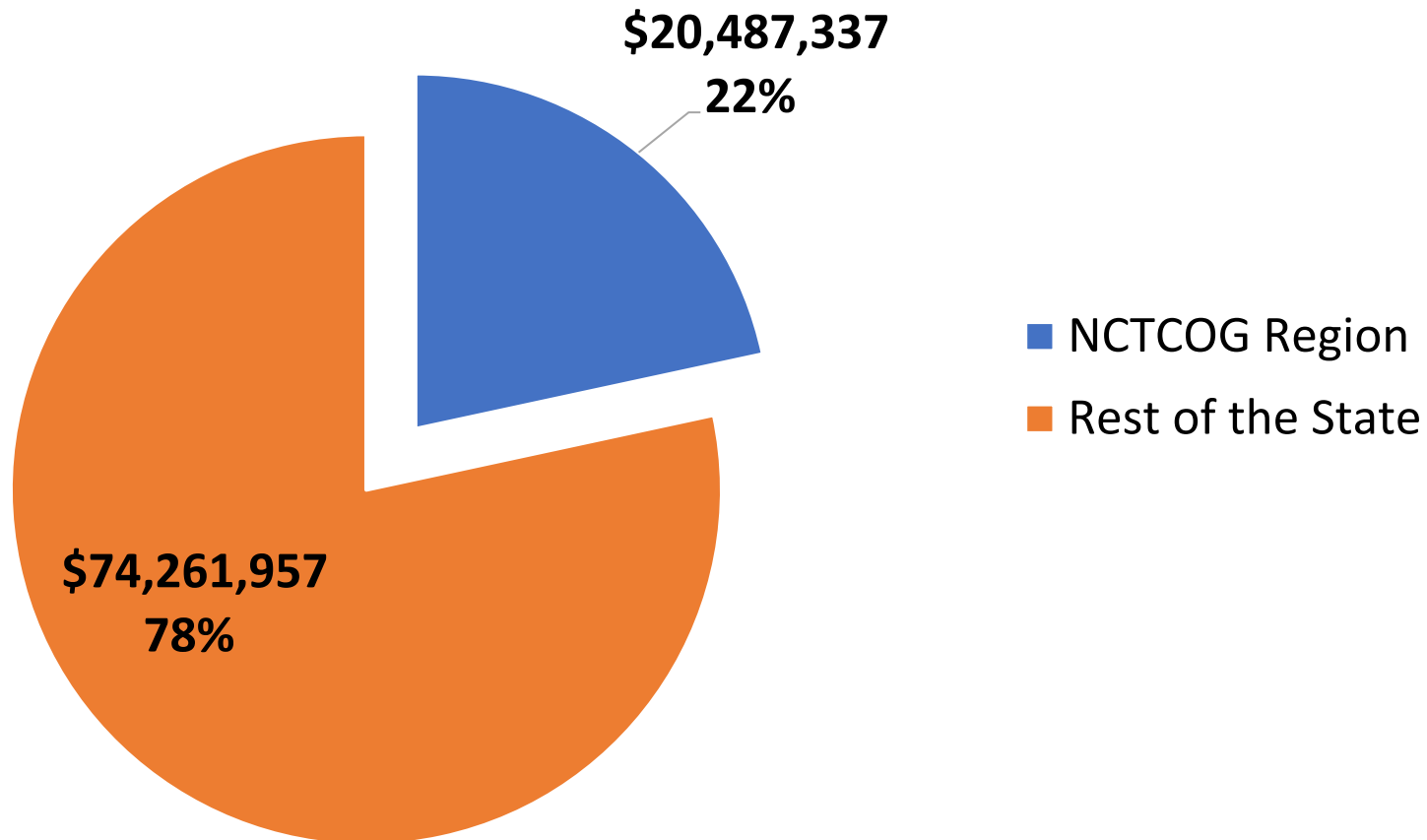
2020

■ NCTCOG Region
■ Rest of the State



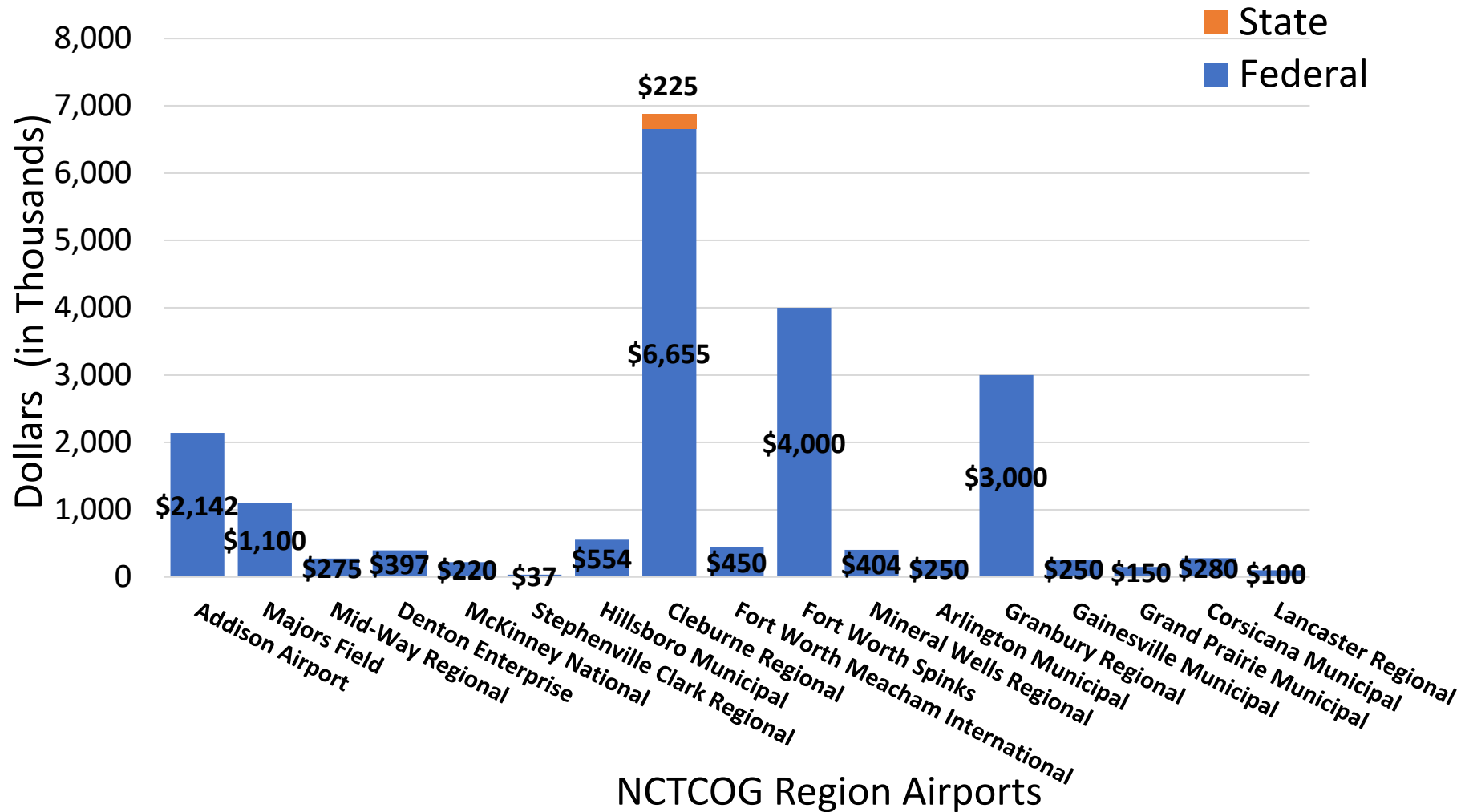
NCTCOG Region vs. Non-Regional Funding

2020



NCTCOG Regional Airport Grant Amount

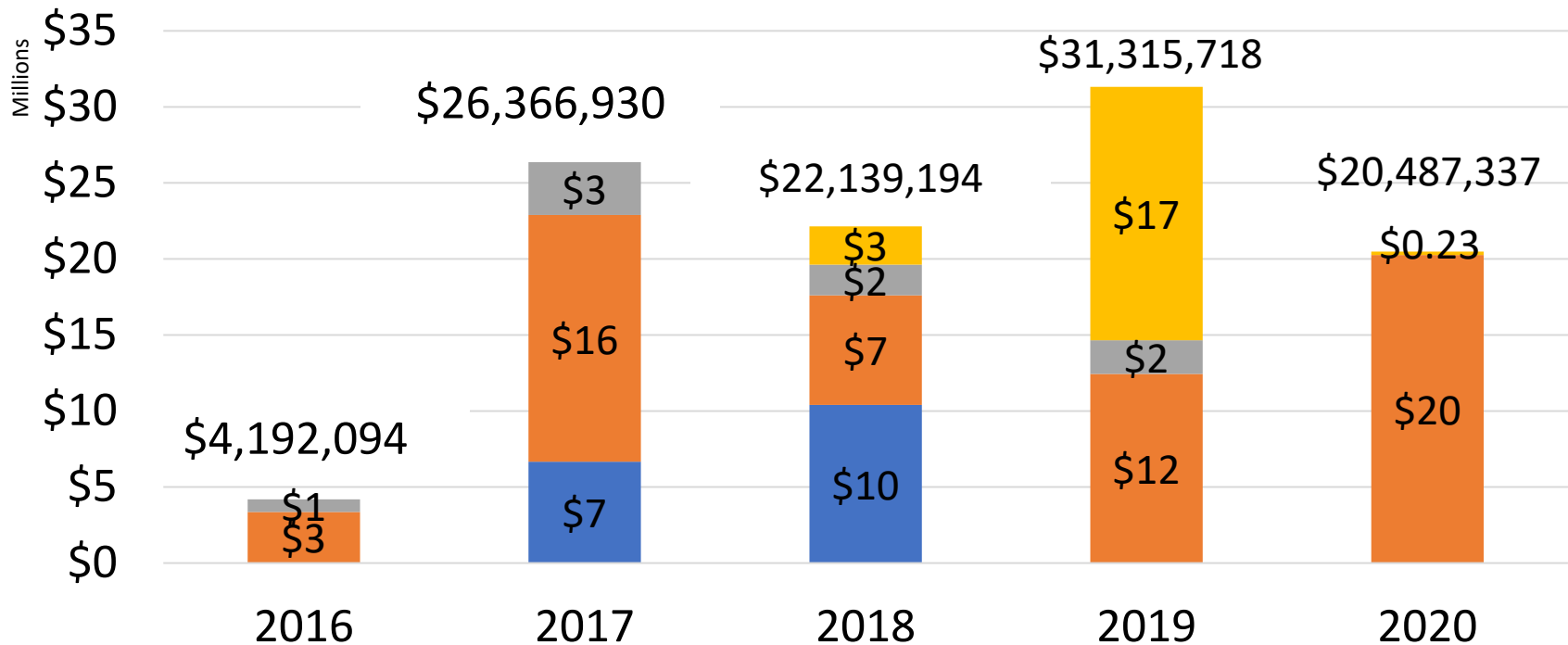
2020



DFW Region

Annual Funding Comparison

■ - Discretionary ■ - Federal ■ - NPE ■ - State



Planning Updates

Regional Aviation System Plan

- Collaborating with TxDOT Aviation and Texas A&M

NCTCOG Fire Code Amendment

- Regional Codes Advisory Boards Call for Nominations
 - Fire Advisory Board
- Pat Stewart added as a member

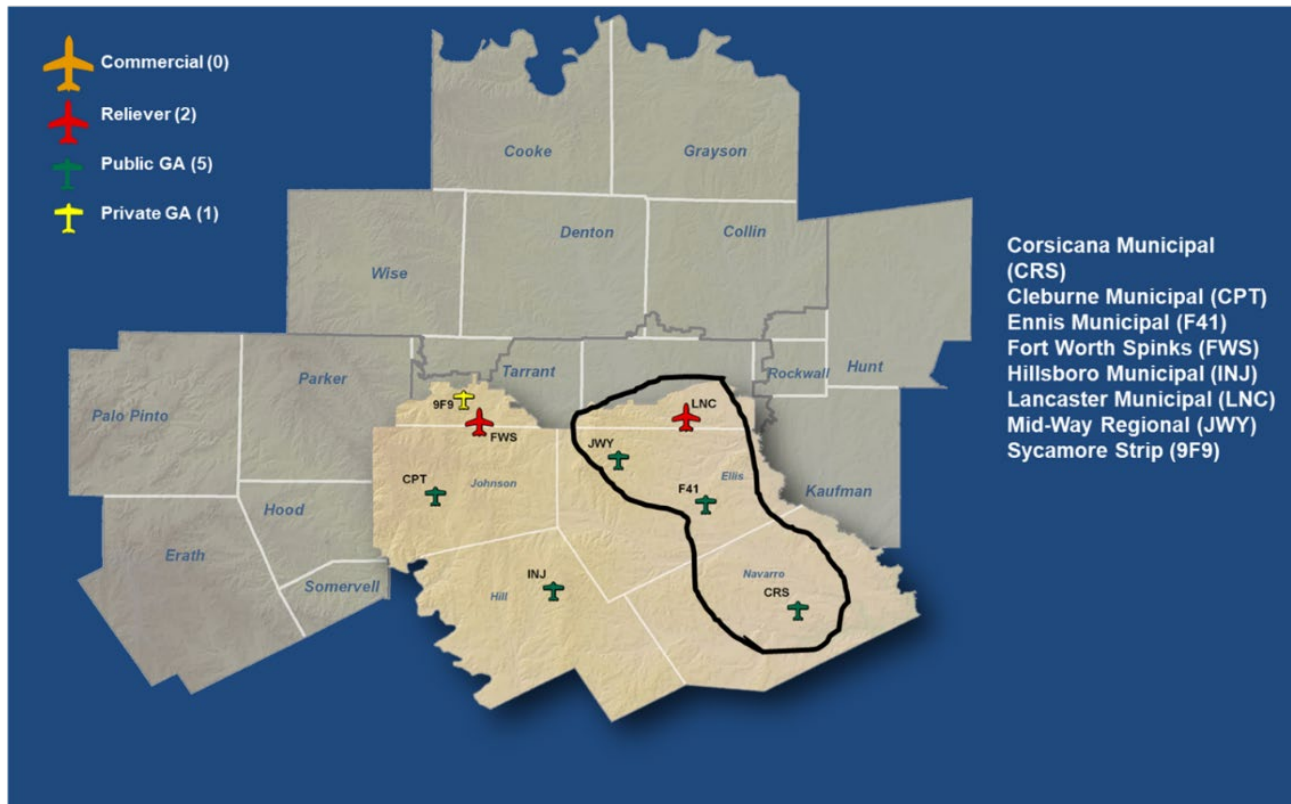
Southeastern Subregion Analysis

Southeastern Subregion Analysis Purpose

As part of the Continuous Regional Aviation System Planning process, the North Central Texas Council of Governments (NCTCOG) consistently monitors the health of the region's aviation system. Because of this, Ennis Municipal airport approached NCTCOG for assistance with a potential replacement airport for the City. As part of that initial discussion, NCTCOG performed a cursory review of the airports in that part of the region, to determine all available options. Following the review, the decreased levels of activity were identified in the Southeastern Subregion and it was determined that additional discussion with the airports was needed.

Southeastern Subregion

SOUTH SUBREGION



Steps Taken

- Reviewed current airport inventory
- Reviewed current airport functions
- Reviewed future airport needs
- Assessed the current and future needs across all airports to ensure services are provided to sustain regional airport system
- Identified gaps in services or functions that need to be implemented
- Discovered the range of possible opportunities
- Provided a list of potential opportunities for each airport (white paper)

Contacts

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